

California Environmental Protection Agency

 **Air Resources Board**





# Presentation Overview

- Meeting Purpose/Public Review Period
- Background
- Methodology for Preparing the Draft Assessments
- Results of the Draft Assessments
- Actions to Reduce Health Risk
- Next Steps



# **Meeting Purpose Public Review Period**



# Purpose and Public Review

## ➤ **Purpose of tonight's meeting:**

- Present our draft analyses and explain results
- Discuss progress being made
- Answer your questions
- Initiate process for review and comment

## ➤ **After tonight's meeting, there will be:**

- Opportunity for comments, both in writing and at second community meeting within 45 days
- Consultation to obtain your ideas on possible future emission reduction actions



# Health Risk Assessment Timelines

Draft Health Risk Assessments to be Completed by <i>Spring 2007</i>		Draft Health Risk Assessments to be Completed by <i>the end of 2007</i>	
Railyard	Company	Railyard	Company
Commerce/Eastern	BNSF	Barstow	BNSF
Hobart	BNSF	San Bernardino	BNSF
Richmond	BNSF	San Diego	BNSF
Stockton	BNSF	Colton	UP
Wilmington (Watson)	BNSF	Dolores (ICTF)	UP
Commerce	UP	Industry	UP
LATC (Los Angeles)	UP	Oakland	UP
Mira Loma	UP		
Stockton	UP		

# BACKGROUND





# Background

- **This effort is part of our commitment to address pollution impacts on communities**
  - Implements the ARB Goods Movement Plan
  - Required by the ARB/UP/BNSF Railroad Agreement
- **The State's goals are to:**
  - Reduce exposure to diesel PM as quickly as possible
  - Reduce risks by at least 85 percent by 2020
  - Obtain the emission reductions needed to attain air quality standards



# Purpose of the Assessments

- Identify pollution sources in the railyards
- Determine exposures to the public
- Estimate the health risks
- Put the railyard risks into perspective with other sources
- Provide information needed to reduce the risk





# Scope of the Draft Assessments

- **Two major parts:**
  - Health risk assessment for the railyard
  - Health risk assessment for significant diesel sources surrounding the community
- **Separate report for each railyard**
- **Combined report for the four Commerce railyards**
- **Focus on diesel PM; other toxic sources evaluated, but small relative to diesel PM**



# Methodology for Preparing the Draft Assessments





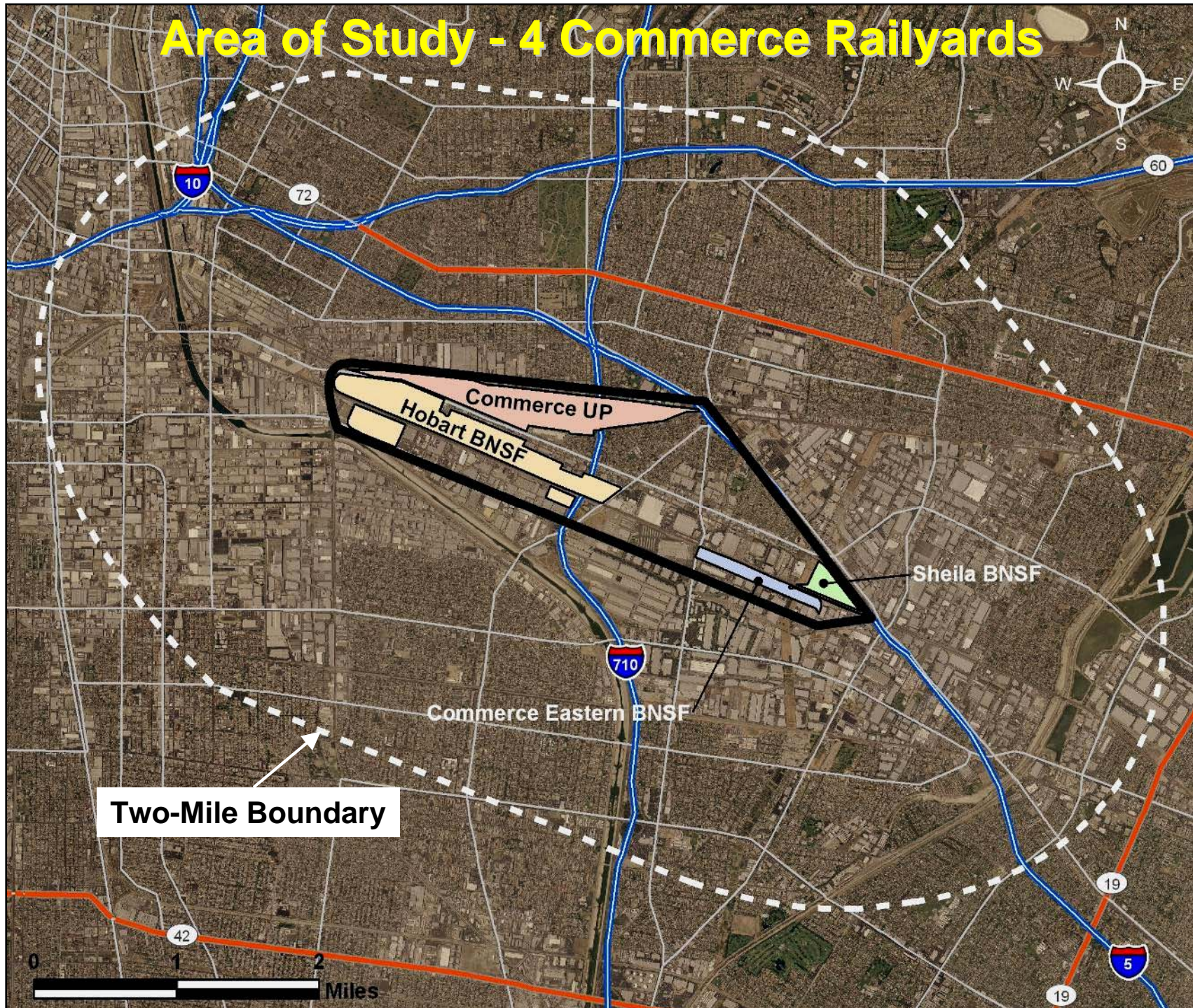
# **Railyard Risk Assessment Methodology**

- **Prepare the best possible emissions inventory**
- **Complete air dispersion modeling**
- **Provide estimates of health risks**
- **Determine other sources of risks**



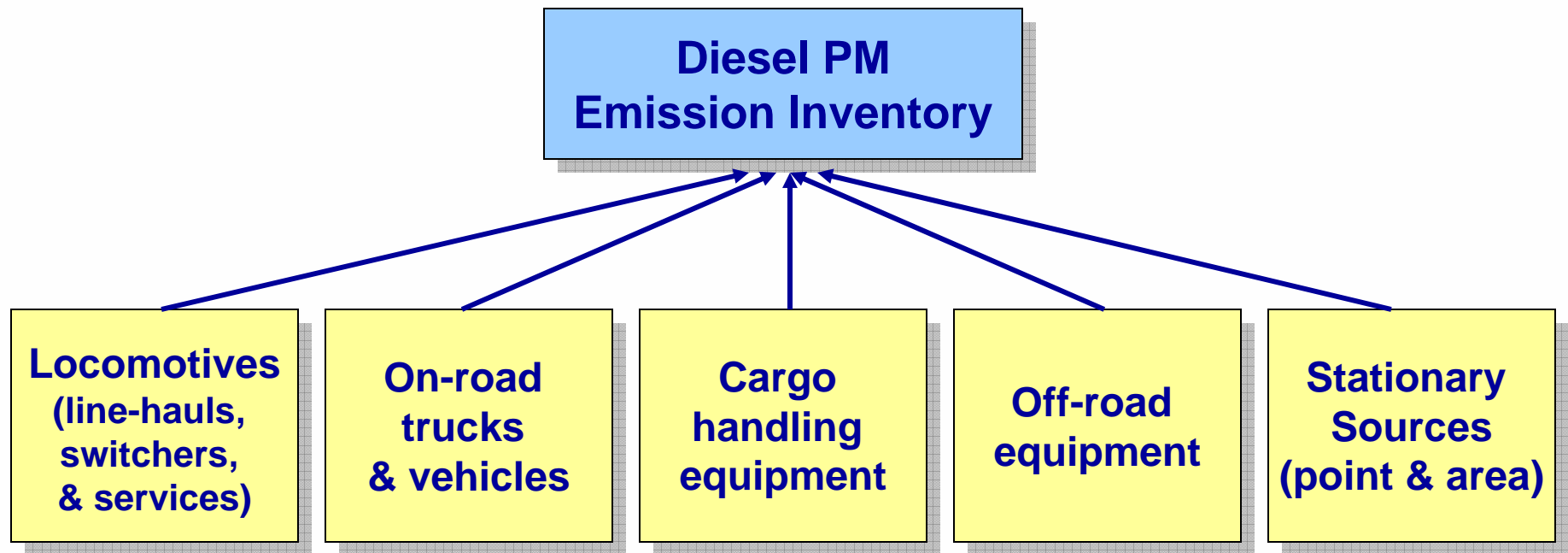


# Area of Study - 4 Commerce Railyards





# Prepare Railyard Emissions Inventory



# Estimating Emissions

- **Fleet/Equipment population**
- **Operational activity**
  - Hours of operation
  - Load factor
  - Vehicle miles traveled (VMT)
  - Hours per day
- **Emission factors**
- **Fuel characteristics**
  - Fuel usage
  - Sulfur content



# Example - Locomotive Emissions

- Number of locomotives by class
- Time operating at each notch setting and in idle mode
- Emission factors by locomotive type and mode (notch setting/idling)
- Hours of operation in each mode
- Types and amount of fuel used





# Summary of Commerce Railyards

## Diesel PM Emissions (2005)

RAILYARD SOURCES	UP Commerce	BNSF Hobart	BNSF Sheila	BNSF Eastern	Total
<b>LOCOMOTIVES</b>	<b>4.9</b>	<b>5.9</b>	<b>2.3</b>	<b>0.6</b>	<b>13.6</b>
Line-haul	1.3	3.7	0.2	0.3	5.5
Switcher	1.9	2.2	0.1	0.2	4.4
Service	1.7	-	2.0	-	3.7
<b>ON-ROAD TRUCKS</b>	<b>2</b>	<b>10.1</b>	<b>-</b>	<b>1.1</b>	<b>13.2</b>
<b>CARGO HANDLING EQUIPMENT</b>	<b>3.9</b>	<b>3.8</b>	<b>-</b>	<b>0.4</b>	<b>8</b>
<b>OTHERS</b>	<b>0.4</b>	<b>3.7</b>	<b>0.4</b>	<b>1</b>	<b>5.5</b>
<b>TOTAL</b>	<b>11.2</b>	<b>23.4</b>	<b>2.7</b>	<b>3</b>	<b>40</b>
<b>% of Total</b>	<b>28%</b>	<b>58%</b>	<b>7%</b>	<b>8%</b>	<b>100%</b>

# Prepare Non-Railyard Emission Inventories

- Focus on diesel PM sources
- Identify the population of trucks on roads
- Apply specific emission factors to the trucks
- Calculate emissions



# Summary of Nearby Non-Railyards Diesel PM Emission Inventory

Sources	Tons per year
Diesel Trucks	113
Stationary Sources	0.2
<b>TOTAL</b>	<b>113.2</b>





# Comparison of Local Diesel PM Sources with Regional Sources

(tons per year in 2005)

Sources	Locomotive	Cargo Handling Equipment	On-Road Trucks	Other (e.g. Ships, Refrig. Trailers)	Total
South Coast Air Basin	300	500	2,000	5,000	7,800
Port of LA/Long Beach	20	170	40	1,570	1,800
Combined Commerce Yards	13.5	8	13	5.5	40
• BNSF Hobart	5.9	3.8	10.1	3.7	23
• UP Commerce	4.9	3.9	2.0	0.4	11
• BNSF Commerce Eastern	0.6	0.4	1.1	1.0	3.1
• BNSF Sheila	2.3	N/A	N/A	0.4	2.7
Nearby Roadways	--	--	113	--	113



# Complete Air Dispersion Modeling

- Use air quality modeling to estimate the amount of diesel PM in the air surrounding a source
- Express results as a “concentration” in units of micrograms per cubic meter of air
- Use U.S. EPA-approved computer models
- Major inputs to the model:
  - Emissions inventory
  - Meteorological data (wind speed/direction, temperature, etc.)



# Estimate Health Risks

- **Combine air dispersion modeling results with toxicity data to estimate health risks**
- **Determine risks for cancer and non-cancer effects**
- **Express results as chances per million for cancer and a “hazard index” for non-cancer impacts**
- **Use toxicity data provided by the California Office of Environmental Health Hazard Assessment**
- **No significant impacts on the communities identified for non-cancer effects**

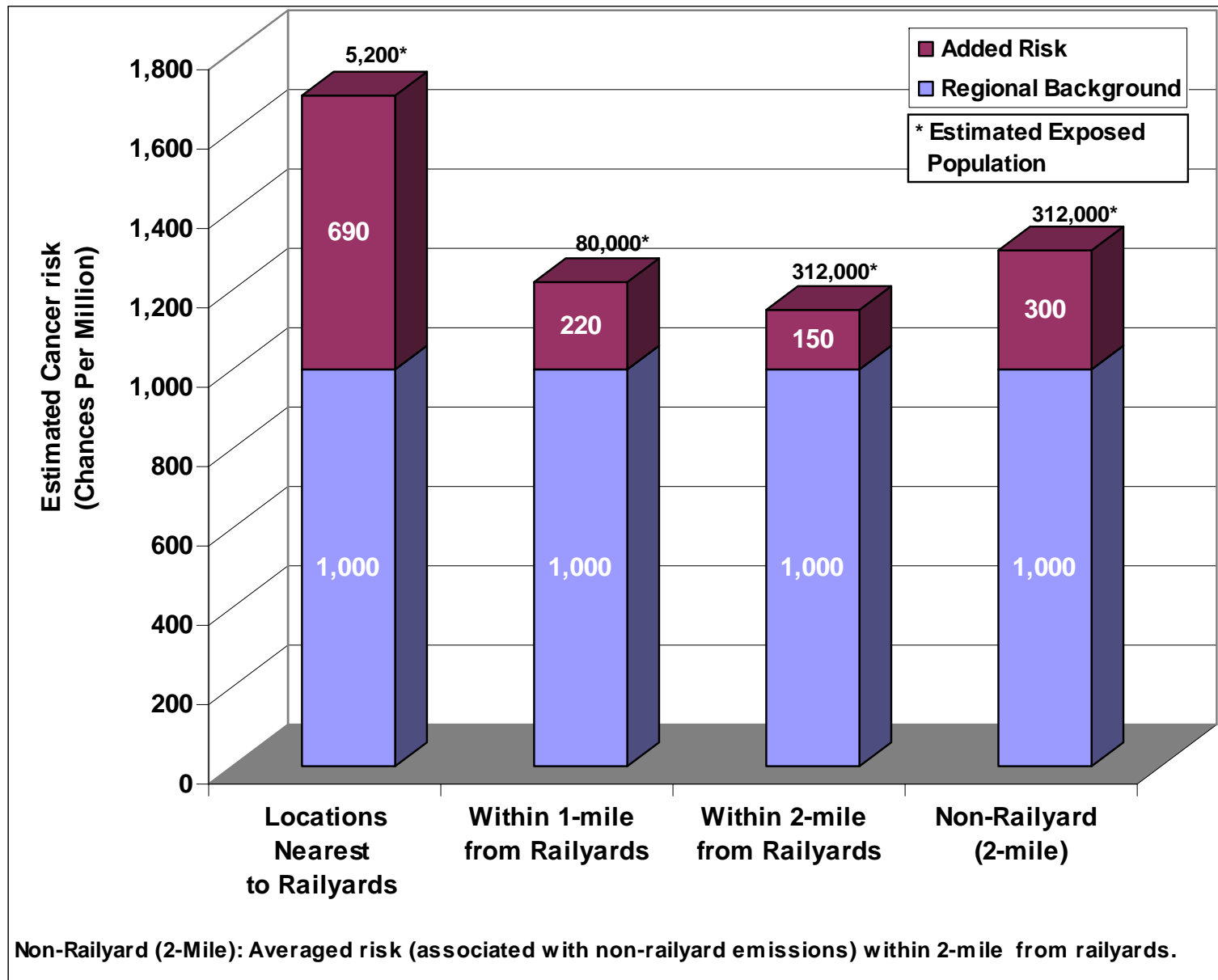




# Results of the Draft Assessments



# Results – Four Commerce Railyards

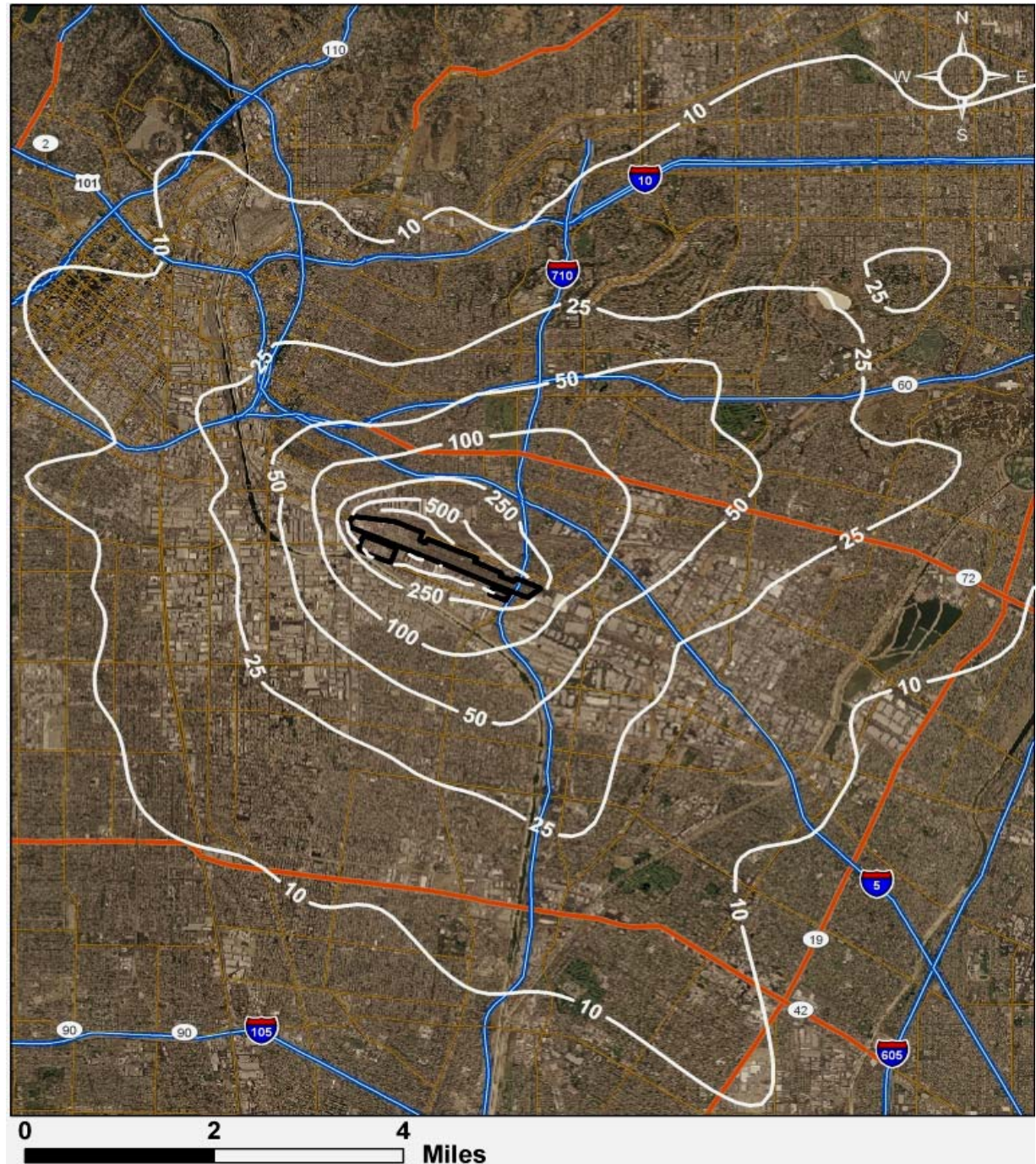




# Results

Location of  
Potential Cancer  
Risks

BNSF Hobart  
Railyard

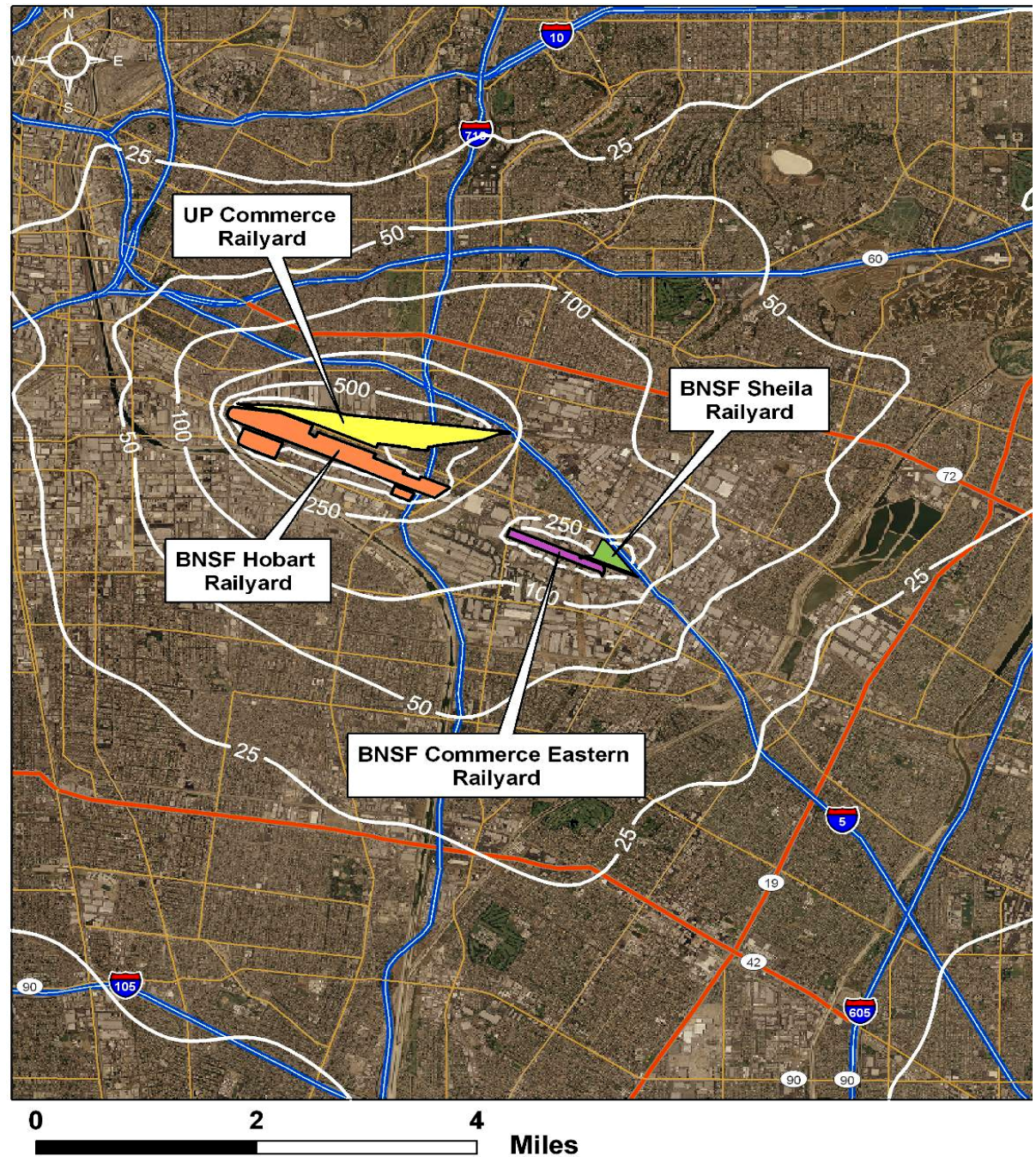




# Results

Location of  
Potential  
Cancer Risks

4 Combined  
Commerce  
Railyards

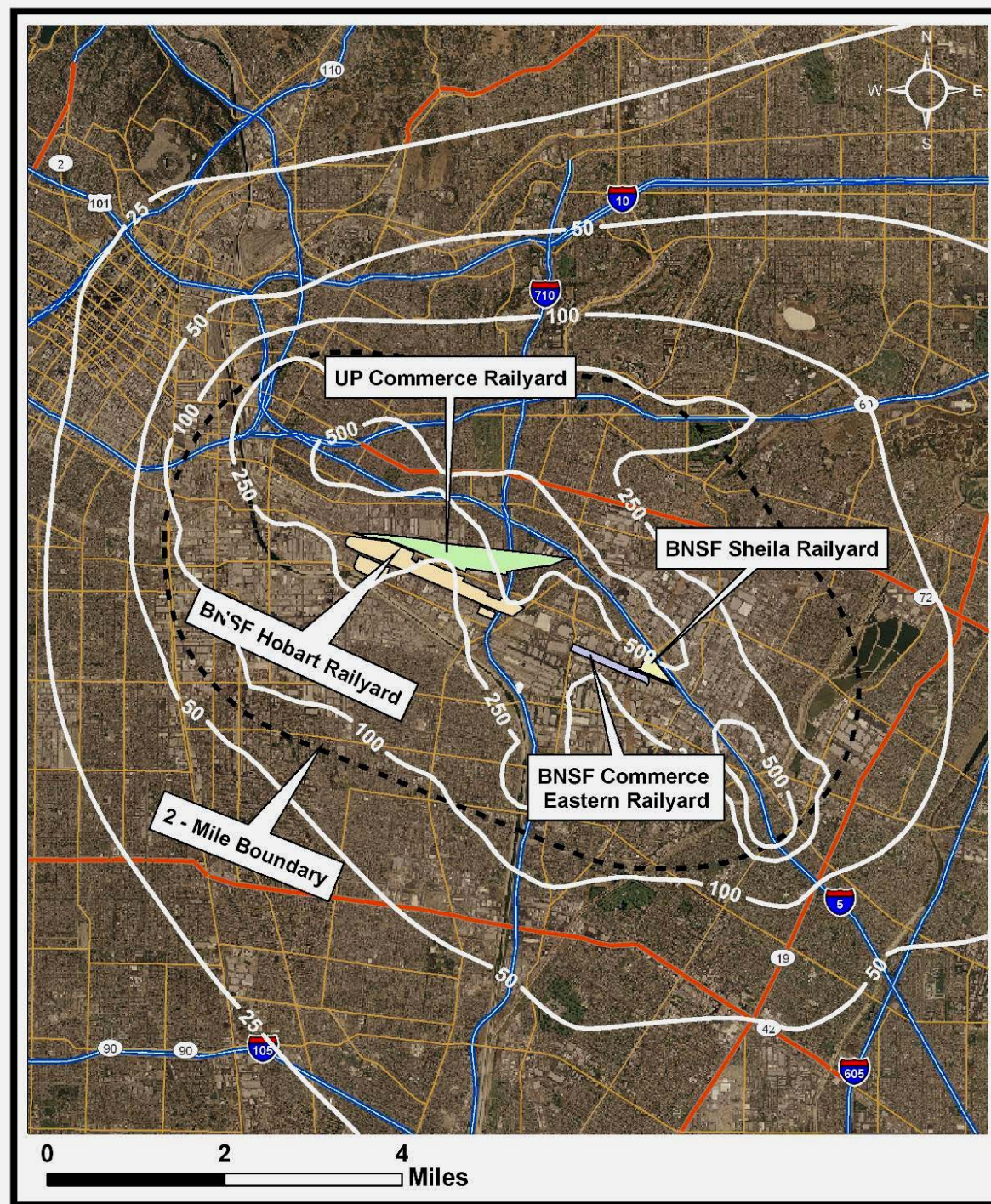




# Results

Location of  
Potential  
Cancer Risks

Non-Railyard  
Sources

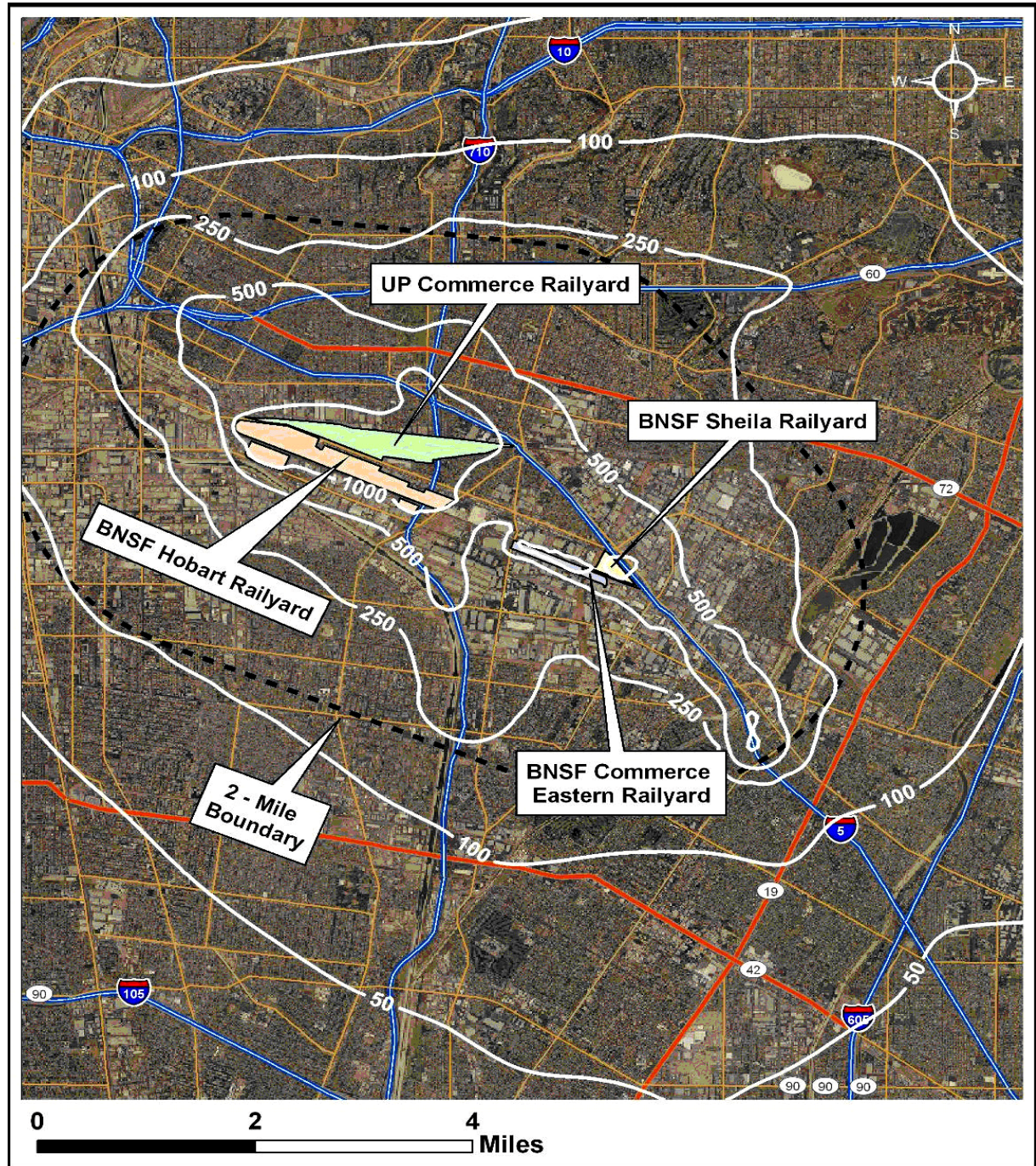




# Results

Location of  
Potential Cancer  
Risks

Four Combined  
Commerce  
Railyards Plus  
the Non-Railyard  
Sources





# Actions to Reduce Health Risk



# Approach to Reducing Emissions

- **ARB regulations**
  - Fuels
  - Cargo handling equipment
  - Transport refrigeration units
  - Heavy-duty diesel on-road trucks and off-road vehicles
- **U.S. EPA regulation**
  - Locomotives
- **Voluntary agreements**
  - 1998 South Coast/2005 Statewide
- **Railroad yard locomotive replacement program**
- **Funding programs**
  - Carl Moyer Incentives





# Benefits of California Railyard Diesel PM Emission Reduction Measures

## ➤ 2005-2007:

- CARB diesel fuel for intrastate locomotives
- 2005 railyard agreement

≈15-20%

## ➤ 2005-2010:

- Measures above plus:
- 1998 NOx locomotive fleet average agreement (South Coast)
- ARB cargo handling equipment regulation
- ARB on-road heavy-duty truck regulation
- ARB transport refrigeration unit regulation

≈40-50%



# Progress Report - Existing Measures

## Diesel Fuel Standards

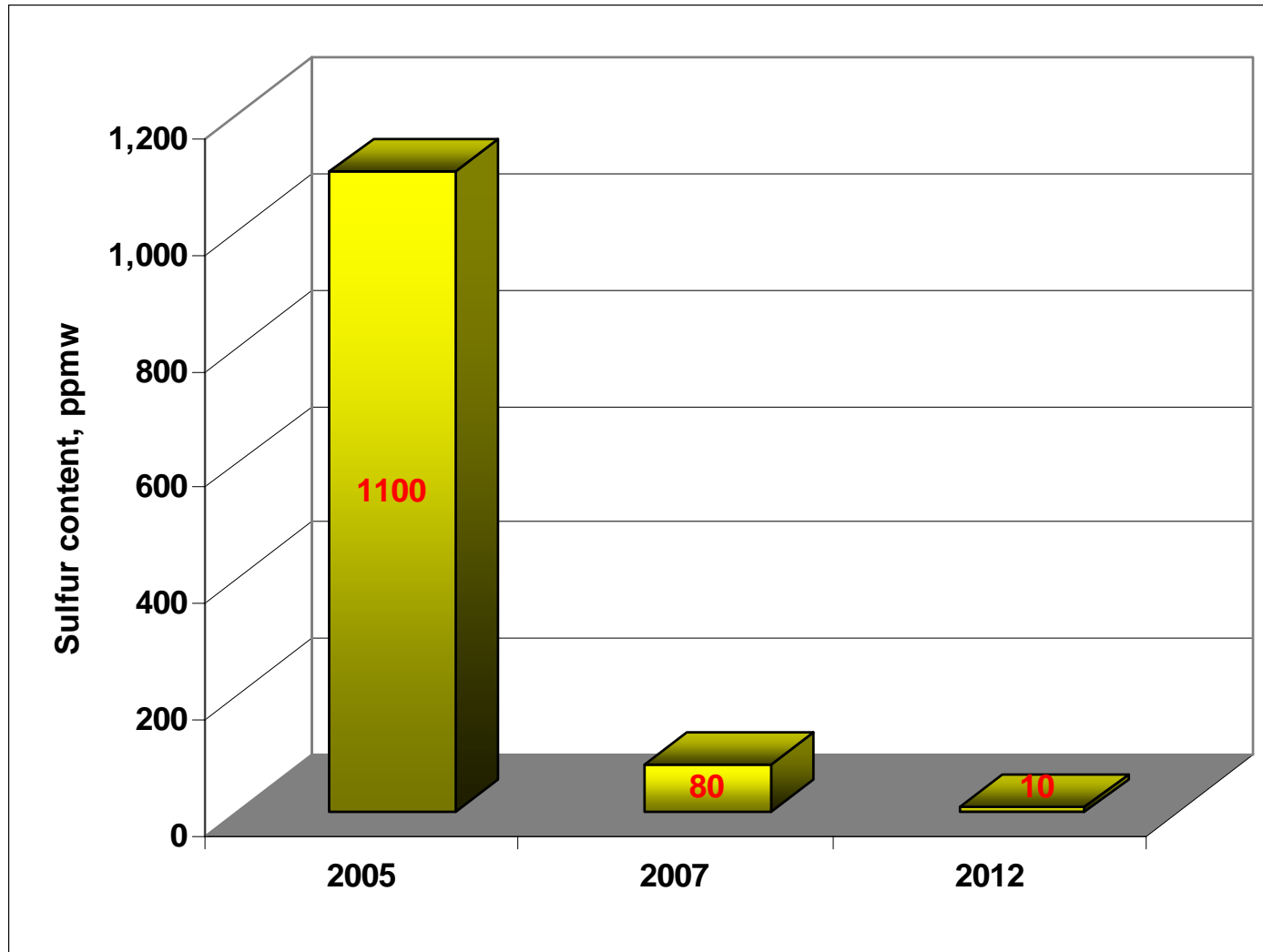
Fuel Type	Maximum Sulfur Level (ppmw)		Aromatics Maximum (% by volume)
	Prior	2006-2007	
CARB Diesel	500	15	10
EPA On-Road Diesel	500	15	35
EPA Non-road Diesel	5,000	500*	35

\* Lower to 15 ppmw in 2012.



# Progress Report - Existing Measures

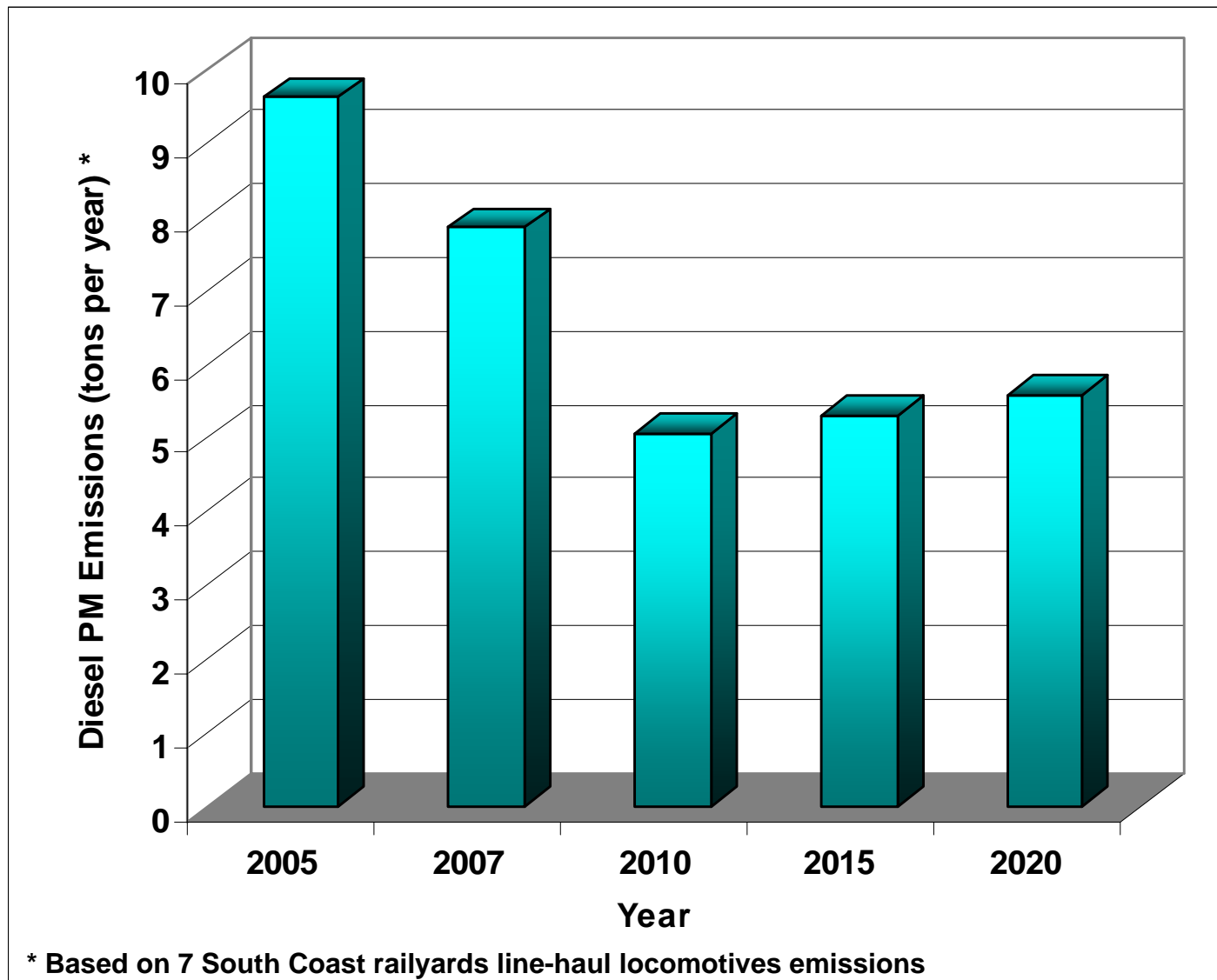
## Average Diesel Fuel Sulfur Levels Consumed by Locomotives in California





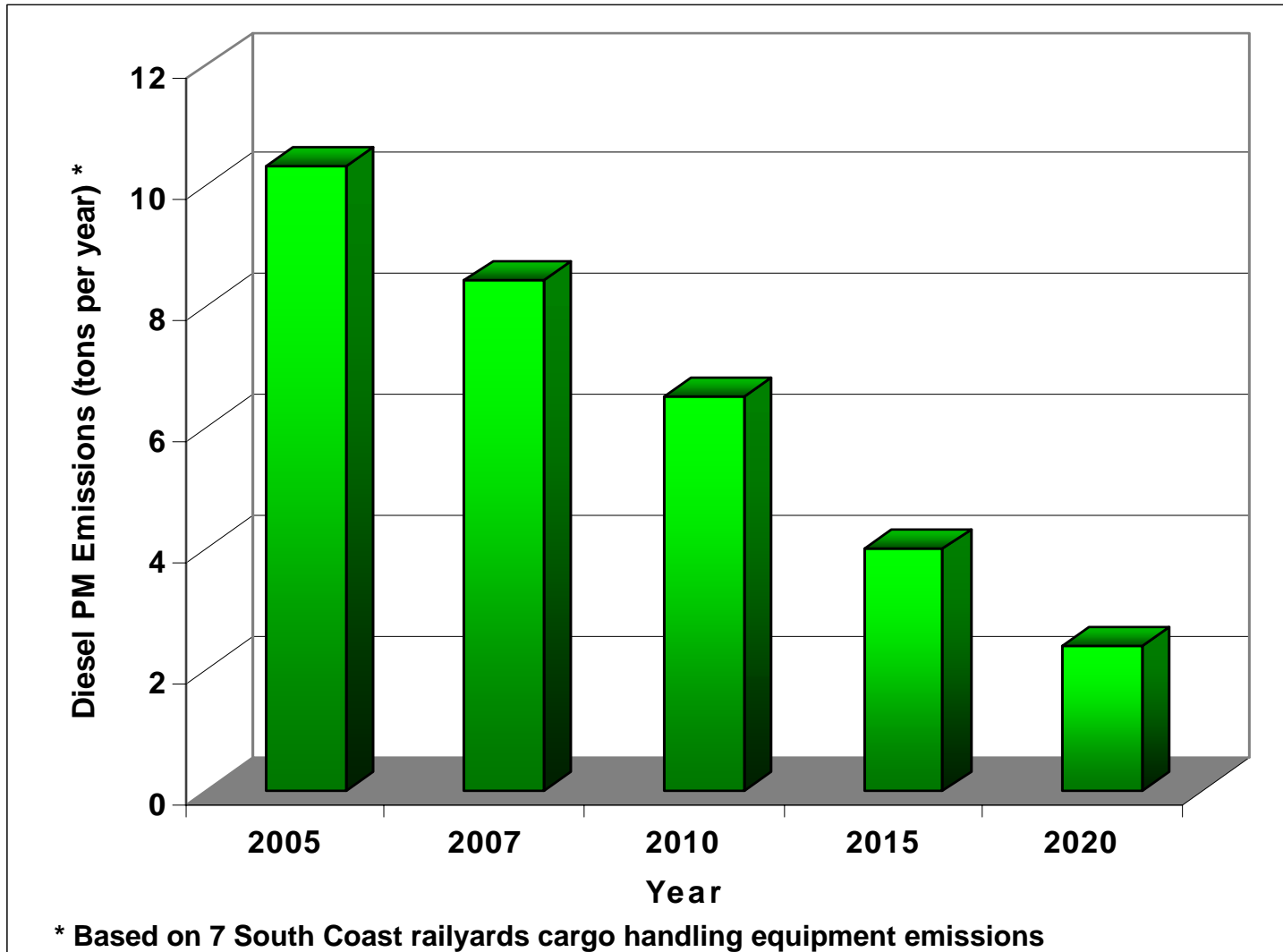
# Progress Report - Existing Measures

## South Coast Railyard Diesel PM Emission Reductions: Line-Haul Locomotives



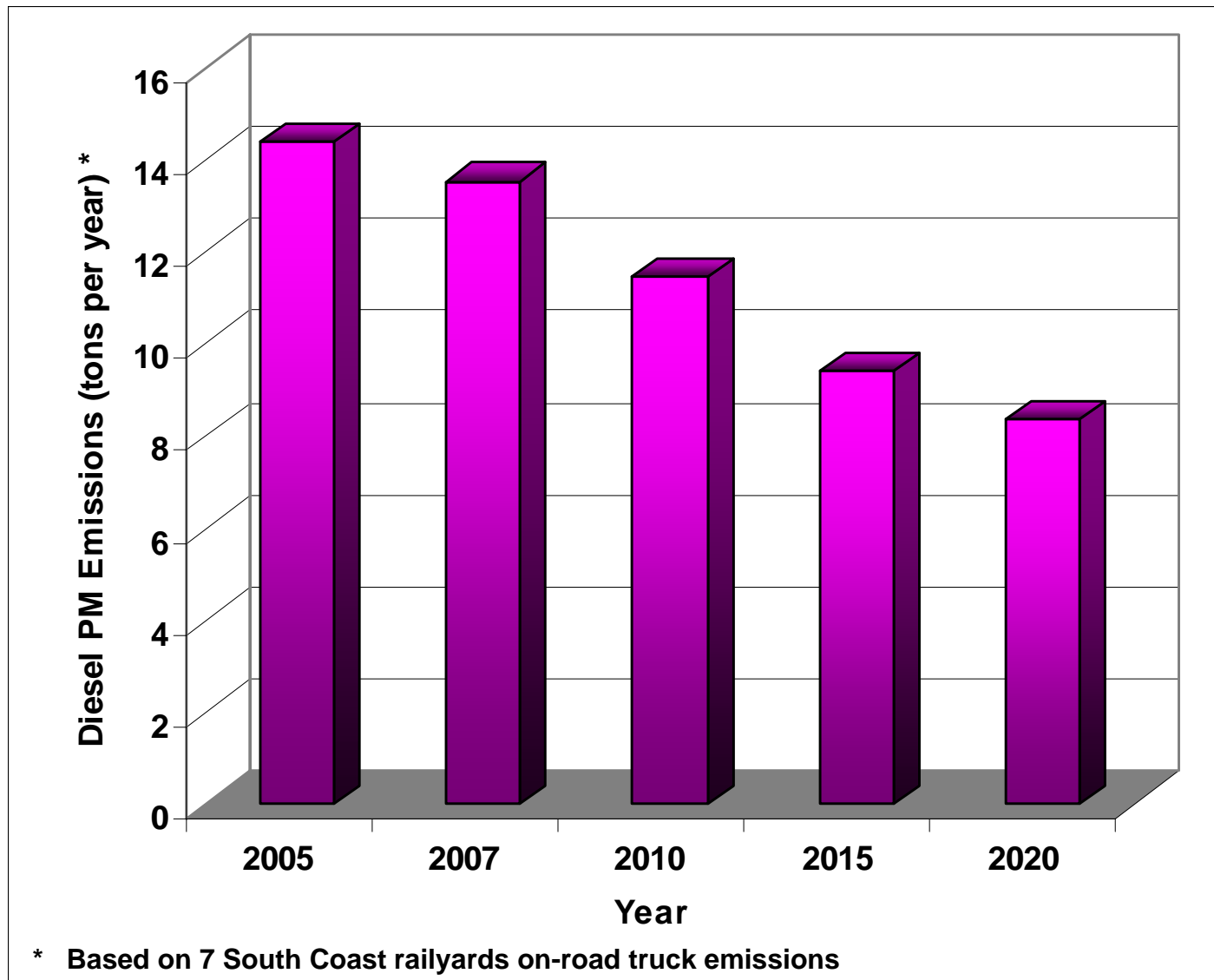
# Progress Report - Existing Measures

## South Coast Railyard Diesel PM Emission Reductions: Cargo Handling Equipment



# Progress Report – Existing Measures

## South Coast Railyard Diesel PM Emission Reductions: New On-Road Trucks





# Possible Additional Measures

## ➤ 2005-2020:

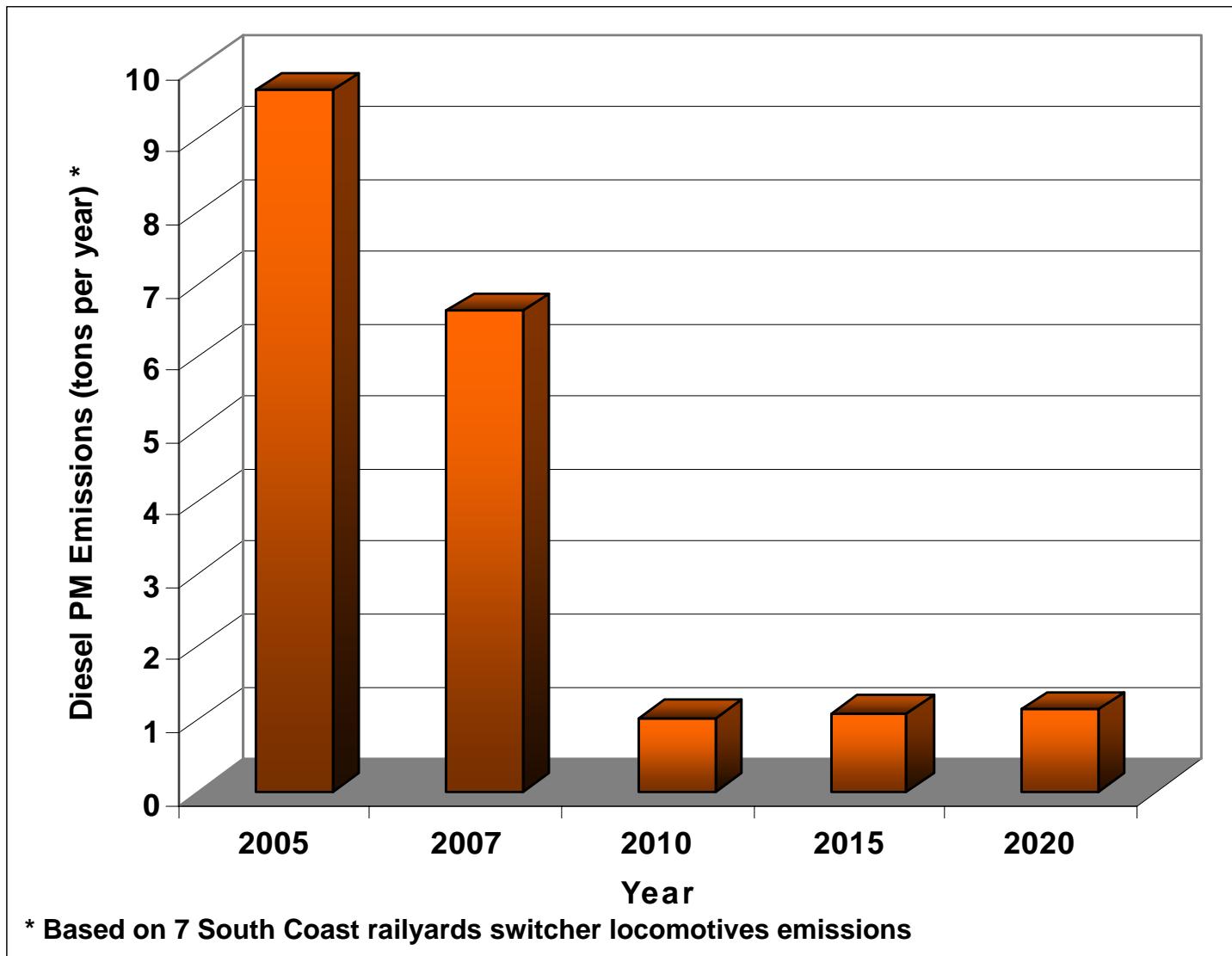
- U.S. EPA locomotive rulemaking
- California replacement of switch locomotives
- ARB in-use truck measure

≈60-80%



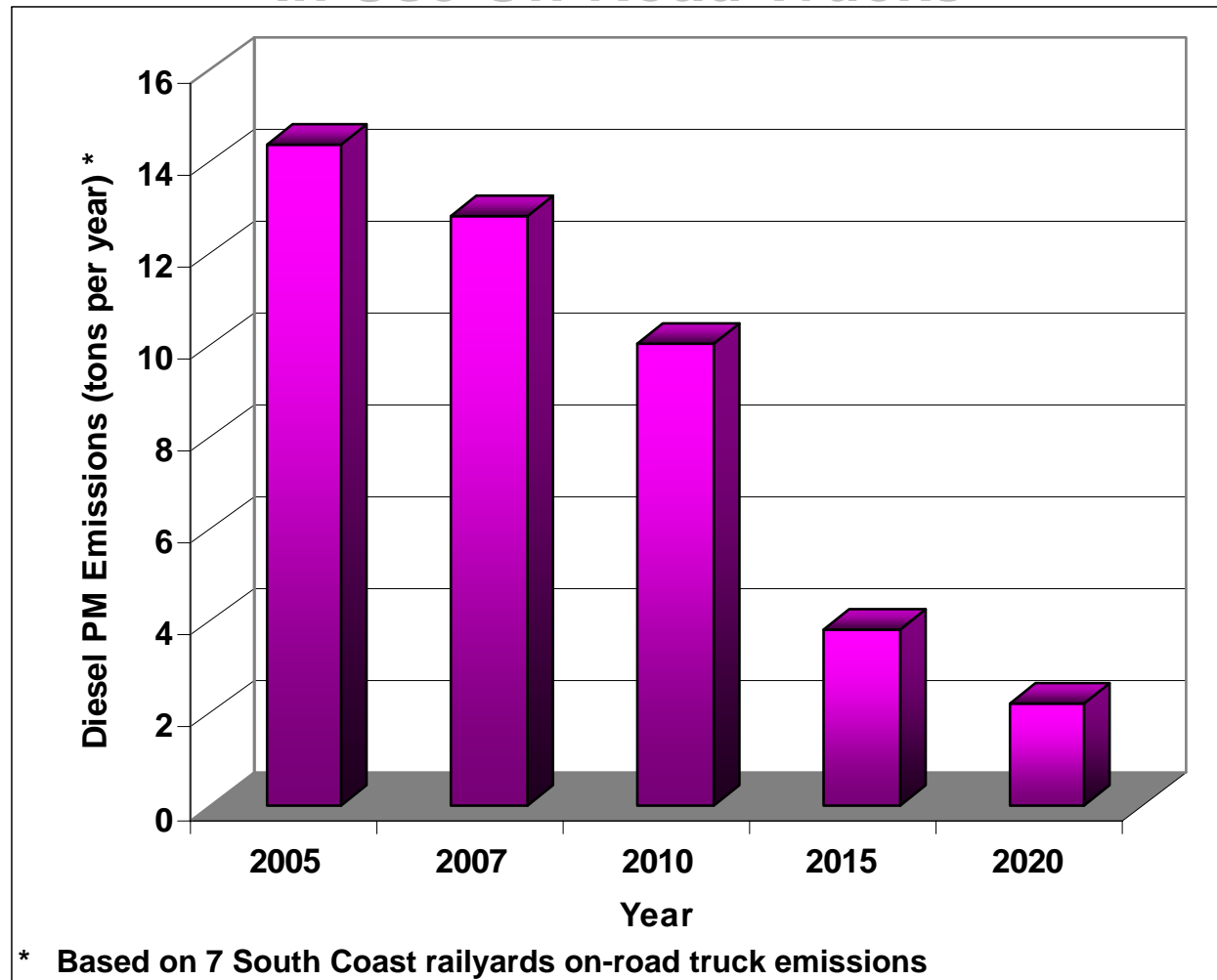
# Progress Report – Potential Measures

## South Coast Railyard Diesel PM Emission Reductions: Switcher Locomotive Replacement by 2010



# Progress Report - Potential Measures

## South Coast Railyard Diesel PM Emission Reductions: In Use On-Road Trucks

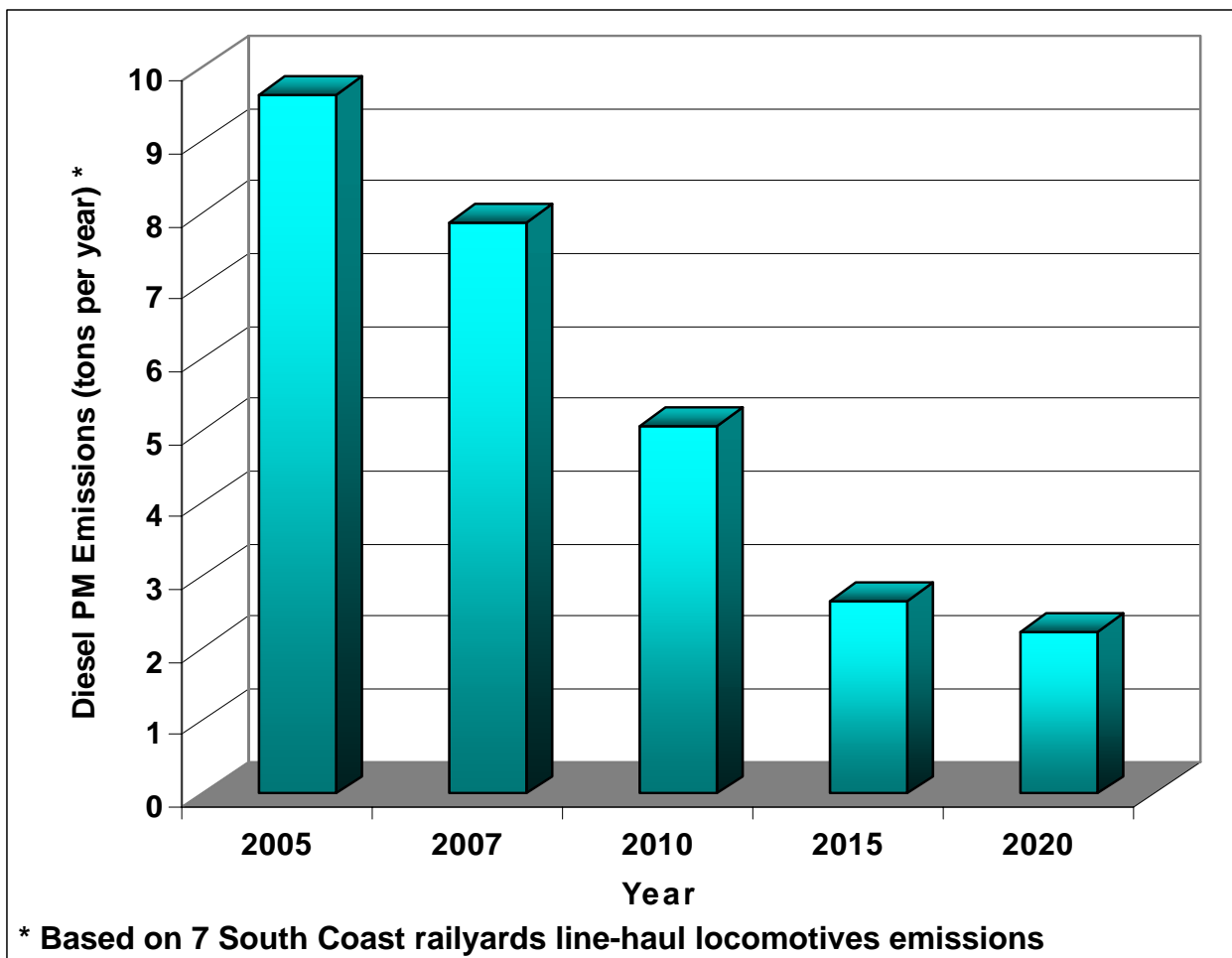


- In addition to the existing on-road heavy-duty truck regulation.



# Progress Report - Potential Measure

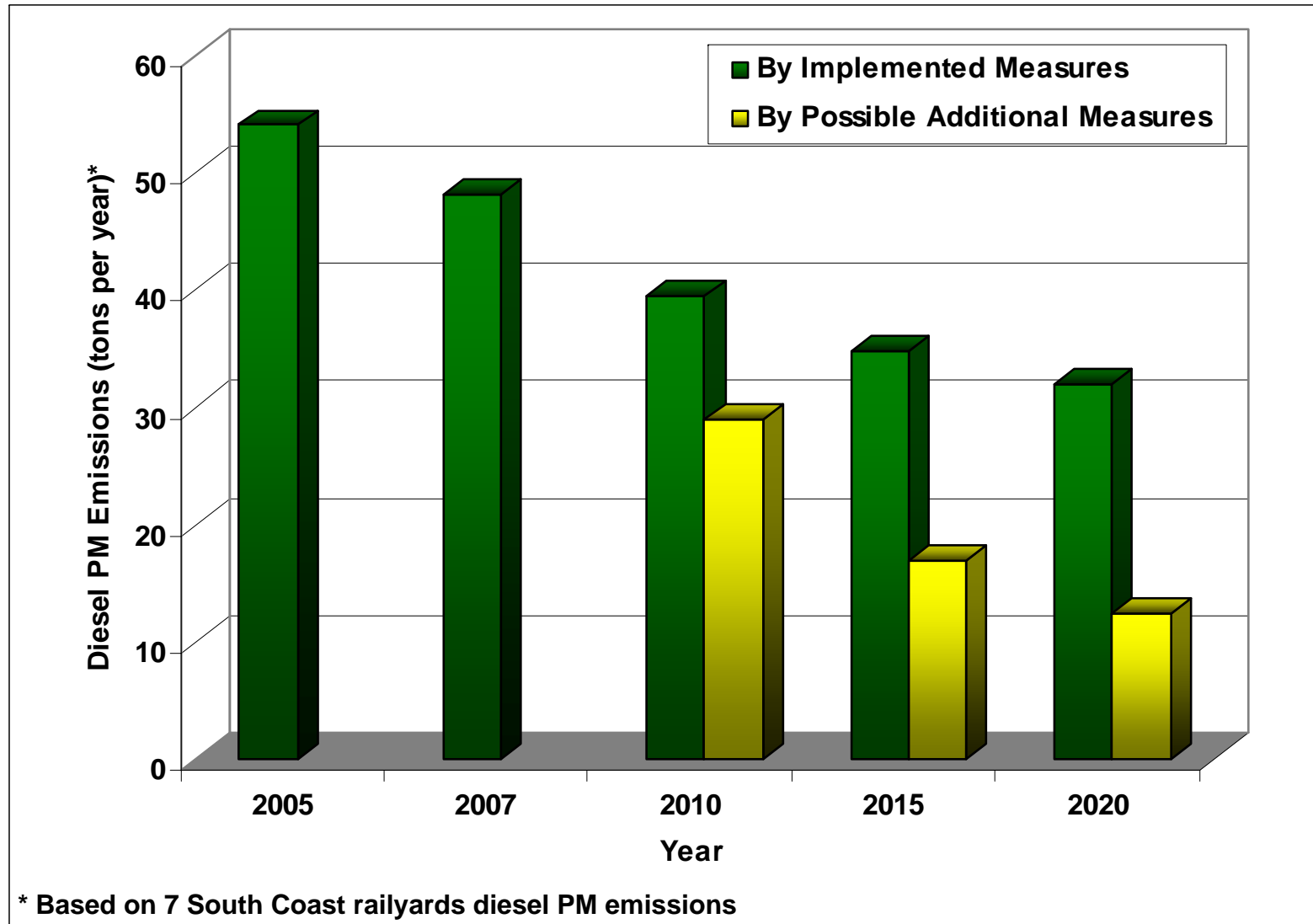
## South Coast Railyard Diesel PM Emission Reductions: U.S. EPA Locomotive Rulemaking



- In addition to the existing Line-haul locomotive fleet average agreement .

# Progress Report - Existing + Potential Measures

## Total Benefits of the Emission Reductions Measures for the South Coast Railyards



# Next Steps





# Next Steps

- **Begin public comment period**
- **Review the draft assessments**
- **Submit written comments to ARB**
- **Hold next series of community meetings**
- **Meet with interested stakeholders**
- **Evaluate any additional feasible mitigation measures**



# ARB Railyard Contacts

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## ➤ ARB Railyard HRA Website:

- <http://www.arb.ca.gov/railyard/hra/hra.htm>